

**CLAIMS**

**What is claimed is:**

- 5           1. A method of automatically verifying capture for use in a cardiac stimulation device, the method comprising:
- delivering a stimulation pulse;
- setting a capture detection window ;
- detecting a post-stimulation cardiac signal sensed during the
- 10          capture detection window;
- identifying a polarity of an amplitude of the post-stimulation cardiac signal;
- confirming capture if the amplitude has a predetermined polarity; and
- 15          confirming loss of capture if the amplitude has a different polarity than the predetermined polarity.
2. The method of claim 1, further comprising coupling an intracardiac electrogram sensing circuit to a sensing electrode via a recharge circuit
- 20          and a block overlap circuit.
3. The method of claim 2, further comprising setting a recharge interval and a block overlap interval to begin after the delivery of a stimulation pulse; and
- 25          enabling a recharge signal and a block overlap signal during the recharge interval and the block overlap interval .
4. The method of claim 3, further comprising applying a recharge signal to the recharge circuit during the recharge interval so that the
- 30          intracardiac electrogram sensing circuit is temporarily uncoupled from a sensing electrode, and an electrode polarization afterpotential is reduced across a load.

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12. The method of claim 1, wherein confirming capture comprises comparing a magnitude of the amplitude to a predetermined capture detection criterion.

13. The method of claim 1, further comprising delivering a back-up stimulation pulse if loss of capture is confirmed.

14. The method of claim 1, further comprising performing a threshold  
5 test if loss of capture is confirmed.

15. The method of claim 1, wherein sampling the cardiac signal further comprises selecting cardiac signal samples having a predetermined polarity.  
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16. The method of claim 15, wherein determining the amplitude comprises determining an amplitude only from selected cardiac signal samples having a predetermined polarity.

17. A cardiac stimulation device capable of automatically verifying capture, comprising:  
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a pulse generator that selectively generates a stimulation pulse for delivery to one or more cardiac chambers;

a timing circuit, connected to the pulse generator, that sets a  
20 capture detection window;

a sensor that senses post-stimulation cardiac signals during the detection windows;

a detector that identifies a polarity of an amplitude of the post-stimulation cardiac signals; and  
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a control circuit that confirms capture if the amplitude has a predetermined polarity, and that confirms loss of capture if the amplitude has a different polarity than the predetermined polarity.

18. The stimulation device of claim 17, further comprising a recharge  
30 circuit and a block overlap circuit that couple an intracardiac electrogram sensing circuit to a sensing electrode.

19. The stimulation device of claim 18, wherein the timing circuit sets a recharge interval and a block overlap interval to begin after the delivery of a stimulation pulse; and

5        wherein the control circuit enables a recharge signal and a block overlap signal during the recharge interval and the block overlap interval.

10        20. The stimulation device of claim 19, wherein the timing circuit further applies a recharge signal to the recharge circuit during the recharge interval so that the intracardiac electrogram sensing circuit is temporarily uncoupled from a sensing electrode, and an electrode polarization afterpotential is reduced across a load.

15        21. The stimulation device of claim 20, wherein the timing circuit further sets a block overlap interval to expire at approximately the same time that a negative peak of an evoked response signal occurs.

20        22. The stimulation device of claim 21, wherein a duration of the block overlap interval exceeds the recharge interval by a predetermined amount of time.

25        23. The stimulation device of claim 22, further comprising a switch that enables a block overlap signal to be applied to the block overlap circuitry during the block overlap interval.

24. The stimulation device of claim 23, wherein the switch disables the block overlap signal upon the expiration of the block overlap interval.

30        25. The stimulation device of claim 24, wherein the timing circuit enables the capture detection window after disabling the block overlap signal.

26. The stimulation device of claim 17, wherein the predetermined polarity of the amplitude is any of a positive polarity or a negative polarity.

27. The stimulation device of claim 26, wherein the polarity of the  
5 amplitude is any of a peak amplitude or a signal integral.

28. The stimulation device of claim 17, wherein the pulse generator is any of an atrial pulse generator or a ventricular pulse generator.

10 29. The stimulation device of claim 28, wherein the sensor is any of a ventricular sensing circuit or an atrial sensing circuit.

30. The stimulation device of claim 29, wherein the sample comprises an analog-to-digital converter.

15 31. A cardiac stimulation device capable of automatically verifying capture, comprising:

means for selectively delivering a stimulation pulse to one or more cardiac chambers;

20 means for sensing a post-stimulation cardiac signal following delivery of a stimulation pulse;

means for identifying a polarity of an amplitude of the post-stimulation cardiac signals; and

25 means for confirming capture if the amplitude has a predetermined polarity, and that confirms loss of capture if the amplitude has a different polarity than the predetermined polarity.

32. The stimulation device of claim 31, further comprising a recharge means and a block overlap means that couple an intracardiac electrogram  
30 sensing circuit to a sensing electrode.

33. The stimulation device of claim 32, further comprising means for setting a recharge interval and a block overlap interval to begin after the delivery of a stimulation pulse; and

wherein the means for confirming enables a recharge signal  
5 and a block overlap signal during the recharge interval and the block overlap interval.

34. The stimulation device of claim 33, further comprising means for applying a recharge signal to the recharge means during the recharge  
10 interval so that the intracardiac electrogram sensing circuit is temporarily uncoupled from a sensing electrode, and an electrode polarization afterpotential is reduced across a load.

35. The stimulation device of claim 34, further comprising means for setting a block overlap interval to expire at approximately the same time  
15 that a negative peak of an evoked response signal occurs; and wherein a duration of the block overlap interval exceeds the recharge interval by a predetermined amount of time.

36. The stimulation device of claim 35, further comprising a switch  
20 that enables a block overlap signal to be applied to the block overlap means during the block overlap interval, and that further disables the block overlap signal upon the expiration of the block overlap interval.

37. The stimulation device of claim 31, wherein the predetermined  
25 polarity of the amplitude is any of a positive polarity or a negative polarity.